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Species

An exclusive revision and annotated catalogue to the Grass Family of Libya

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ABSTRACT

The present study represents an exclusive taxonomic revision of the grass family since the publication of the family Poaceae, Flora of Libya, No.145 in 1988 by Sherif et al. [15]. This study, however, concerns with grass species, which are represented by voucher specimens, and deposited at the National herbarium, Faculty of Science, Tripoli University [ULT]. Taxa, which are not represented by voucher specimens excluded from this study. The present study includes 19 tibes, 73 genera and 152 species with 3 new records *Bromus uniloides, Chloris gayana,* and *Eriochloa fatmensis*, and 2 endemics *Poa pentapolitana*, and *Poa vaginata*. The results of this study have shown that the tribes Festuceae, Hordeae, Aveneae, Paniceae and Andropogoneae are the most sizable tribes with 41, 20, 17,16, 10 species respectively. Keys to the tribes, genera within each tribe, and species within each genus are constructed. An annotated list of the species in each genus follows the key. In addition to that, citations, synonyms, and geographical distribution of

each grass species in Libya was giving. The distribution of grasses is based primarily on the collected materials deposited in the herbarium [ULT]. An excluded list of 79 species is also giving.

Keywords: Poaceae, Grasses, Flora Libya, Tribes, Graminae

1. INTRODUCTON

This paper concerns with the grass family (Poaceae) in Libya, which is a North African country that lies between 18° 33' N latitude & 9° 25' E longitude, and occupies an area of 1.759.59 km^2 [5]. Libya is bounded by the Mediterranean Sea to the north, Egypt to the east, Tunisia and Algeria to the west, and Sudan, Chad, and Niger to the south [Figure 1]. The climate of Libya varies from aird-semi ared with scarcity of rainfall [8]; such climatic conditions make the flora of Libya in general poor with regard to its vast area. The history of plant exploration in the flora of Libya [including the grass family] dates back to 1881[1], since then many publications on the Libyan flora, which included the family Poaceae have been published by several authors [3-4, and 7-12]. In 1988, Sherif et al. [15] have described 228 grass species in flora of Libya. A total of 79 different grass species are excluded from this study due to lack of herbarium sheaths to represent them, the fear is that such species could be extinct since they have not been collected and/or seen in the recent years in Libya. Therefore, this study deals mainly with grass species, which are represented by voucher specimens. Three grass species are recorded as a new to the grass family as well as to the flora of Libya; these are *Bromus uniloides [*13], *Chloris gayana* [6], and *Eriochloa fatmensis* [16]. The distribution data for each species in Libya was also provided. The aim of this study is to shade the light on the actual number of grass species truly exist in Libya.

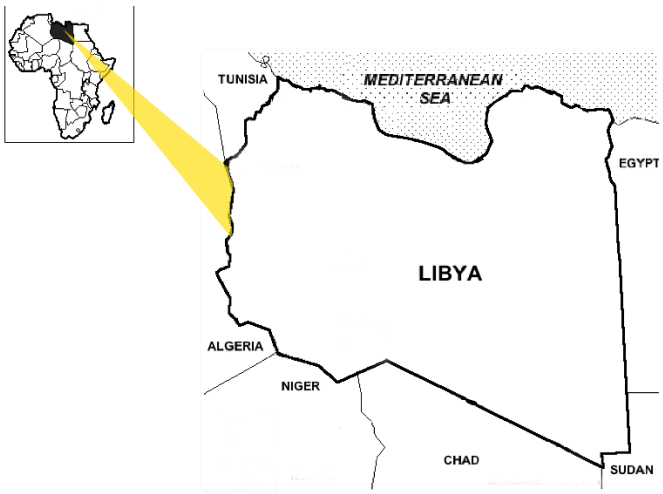

Figure 1 Map of Libya showing location in Africa and bordered countries.

2. METHODS

The basic morphological characters needed for this study was derived from the examination of the grass specimens, which are deposited in herbarium [ULT]. Keys for all the tribes, genera, and species of Libyan grasses were constructed based on qualitative and quantitative morphological characters. An annotated list of the species in each genus follows the keys. The nomenclature for all studied species follows that presented in the flora of Libya, family Poaceae [15]. Tribes, genera, and species included in this study are arranged alphabetically.

Key to the tribes

Nineteen tribes represent the grass family in Libya. Key for the tribes is based on morphological characters.

1. Inflorescence with spikelets bearing only unisexual florets.....19. Tripsaceae
1. Inflorescence with spikelets bearing at least one bisexual florets.....2
    2. Spikelets sometimes arranged on both sides of the rachis or embedded in cavities.....10.Hordeae

2. Spikelets not as above.....5
4. Inflorescencs head-like panicle; lemmas 7-9-nerved rounded on the back .....1. Aeluropodeae
4. Inflorescence digitat panicle; lemmas not 7-9-nerved.....7. Chlorideae
5. Spikelets in pairs, one sissile, the other one/ or both pedicellate ..... 3. Andropogoneae
5. Spikelets not in pairs, if appearing so, then both pedicellate or sessile.....6
6. Plants reed-like grasses with broad leaf-blades.....5. Arundineae
6. Plants not as above.....7
7. Inflorescence solitary, terminal; spikelets with 2 florets enclosed within a spathe-like sheath.....11. Lygeae
7. Inflorescence not solitary, if so, then not enclosed within a spathe-like sheath.....8
8. Spikelets with 1 floret.....9
8. Spikelets with 2 or more florets.....14
9. Both glumes (or at least the first glume) covered with stout, hooked spines.....19. Zoysieae
9. Both glumes not covered with stout, hooked spines 10
10. Lemma haylin at maturity.....11
10. Lemma indurate at maturity.....12
11. Lemma 5-nerved.....2. Agrostideae
11. Lemma 1-3-nerved.....16. Sporoboleae
12. Spikelets small with long or short pedicels, dorsally compressed, awnless.....13. Milieae
12. Spikelets not as above.....13
13. Lemma with a triparted awn.....4. Aristideae
13. Lemma with a single awn.....17.Stipeae
14. Terminal floret sterile and club-shaped.....12. Meliceae
14. Terminal floret not as above.....15
15. Spikelets with lower florets empty or sterile and upper florets fertile.....16
15. Spikelets with lower florets fertile and upper florets sterile..... 17
16. Both glumes equal-subequal and winged on the keels.....15. Phalarideae
16. Both glumes unequal and not winged on the keels.....14. Paniceae
17. Glumes or at least lower glume longer than the lowest floret.....6. Aveneae
17. Glumes or at least lower glume shorter than the lowest floret.....18
18. Lemma 3-nerved.....8. Eragrostideae
18. Lemma not as above.....9. Festuceae

TRIBE 1: AELUROPODEAE

Plants perennial. Inflorescence spike-like or head-like panicle. Spikelets subsessile arranged along one side of the rachis. Glumes unequal. Lemmas 7-9-nerved. It is represented by 1 genus and 1 species.

1. Aeluropus Trin., Fund. Agrost. 143. 1822.

Aeluropus lagopoides (L.) Trin. Ex thw., Enum. Pl. Zeyl. 374. 1864.
Dactylis lagopoides L. Ment. Pl. 1:33.1767; *Aeluropus repens* (Desf.) Parl., Fl. Ital. 1:462.1848; *A.littoralis* var. *repens* (Desf.) Coss. Et Dur., Expl. Sci. Alg. 155. 1855.
Distribution: Tripolitania and N. Cyrenaica.

TRIBE 2: AGROSTIDEAE

Inflorescence spike-like, capitate or an open or contracted panicle. Spikelets with one floret; both glumes longer than lemma. It is represented by 6 genera and 7 species.

Key to the genera

1. Inflorescence spike- like panical, terminal, curved or straight.....2
1. Inflorescence capitate.....4. *Lagurus*
2. Both glumes swollen at the base.....3. *Gastridium*

2. Both glumes not swollen at the base 3
3. Leaf blade c. 60 cm long or more; glumes c. 1 cm long or more.....2. *Ammophila*
3. Leaf blade and glumes shorter than the above.....4
4. Spikelets sunken in cavities of the axis.....5. *Paraphiolis*
4. Spikelets not sunken in cavities of the axis.....5
5. Glumes fused at the base.....1.*Alopecurus*
5. Glumes not fused at the base.....6. *Polypogon*

1. Alopecurus L., Sp. Pl. 60. 1753; Gen. Pl. ed. 5: 30.1754.

1.1. *Alopecurus myosuroides* Huds., Angl. ed. 1: 23. 1762.
A. agretis L., Sp. Pl. ed. 2: 89. 1762.
Distribution: Tripolitania and N. Cyrenaica.
This species is a good forage grass.

2. Ammophila Host., Gram. Austr. 4: 24, t. 41. 1809.

2.1. *Ammophila australis* (Mabille) Porta et Rigo, Exs. Ital. 2: nr. 36. 1875.
Psmma australis Mabille, Rech. Pl. Corse. 1: 33. 1867; *A. arenaria* (L.) Link, var. australis (Mabilla) Durand & Baratte, Fl. Lib. Prodr. 225, 1910.
Distribution: Tripolitain and N. Cyrenaica.

3. Gastridium P. Beauv., Ess. Arrost. 21, t.6, fig.6. 1812.

3.1. *Gastridium ventricosum* (Gouan) Schinz et Thell. In Vierteljahrschr. Naturf. Ges. Zurich 58: 39. 1931.
Agrostis ventricosa Gouan, Hortus. Monsp. 39, t.1, fig.2. 1762; *milium Lendigerum* L. Sp. Pl. ed. 2, 91.1762; *G. lendigerum* (L.) Desr., Obs. Pl. Angers, 48. 1818.
Distribution: N. Cyrenaica.

4. Lagurus L. Sp. Pl. 81. 753; Gen. Pl. ed. 5: 34. 1754.
A monotypic genus.

4.1. *Lagurus ovatus* L., Sp. Pl. 81.1753.
Distribution: Tripolitania and N. Cyrenaica.

5. Parapholis C. E. Hubbard in Blumea, Suppl. 3: 14. 1946.

5.1. *Parapholis incurve* (L.) C.E. Hubbard in Blumea, Suppl. 3: 14. 1946.
Aegilops incurva L. Sp. Pl. ed. 1.1051. 1753; *A. incurvata* L., Sp. Pl. ed. 2: 1490. 1763; *Lepturus incurvatus* (L.) Trin. Found. Agrost. 123. 1820; *Pholiurus incurvatus* (L.) Hitchcock, in U.S. Dept. Agr. Bull. 772. 106. 1920.
Distribution: Tripolitania and N. Cyrenaica.

6. Polypogon Desf., Fl. Atlant. 1: 66. 1798.

1. Glumes awned.....1. *P. monspeliensis*
1. Glumes awnless.....2. *P. semiverticillatus*

6.1. *Polypogon monspeliensis* (L.) Desf., Fl. Atlant. 1: 67. 1798.
Alopecurus monspelieensis L. Sp. Pl. 61. 1753.
Distribution: Tripolitania, N. Cyrenaica, and Fezzan.

6.2. *Polypogon semiverticillatus* (Forsk.) Hyl., in Uppsala Univ. Arsskr. No. 7.74.1945.
Phalaris semiverticillata Forsk., Fl. Aeg. - Arab. 17.1775; *Agrostis verticillata* Villa, Pl. Dauph. 2: 47. 1779;
Polypogon littoralis Sm. var. *muticus* Hook.f. Fl. Brit. Ind.7: 246. 1896; *Polypogon semiverticillatus* (Forsk.) Hyl. in UppsalaUniv. Arsskr. 7:74.1945*; Agrostis semiverticillata* (Forsk.) Christ. Dansk. Bot. Archiv. 4, 3:12.1922.
Distribution: Tripolitania and N. Cyrenaica.

TRIBE 3. ANDROPOGONEAE

Annual or perennial. Inflorescence spike-like; spikelets in pairs with one sessile and the other pedicellate; glumes indurate.It is represented by 8 genera and 10 species.

Key to the genera

1. Spikelets all alike (bothh sessil & pedicellate spikelets perfect).....2
1. Spikelets not as above (sessile spikelets perfect, pedicellate one absent or staminate).....3
2. Inflorescence spike-like; spikelets awnless; callus hair longer than spikelet.....5. *Imperata*
2. Inflorescence panicle; spikelets awned; callus hairs as long as spikelet.....7.*Saccharum*
3. Inflorescence panicle..... 8. *Sorghum*
3. Inflorescence spike-like, rasemose or digitate.....4
4. Lemma of sessile spikelets awnless.....6. *Lasiurus*
4. Lemma of sessile spikelets awned.....5
5. Inflorescence subtended by spatheoles.....6
5. Inflorescence not subtented by spatheoles.....7
6. Awn glabrous; plants aromatic.....2. *Cymbopogon*
6. Awn pubescent; plants not aromatic.....4. *Hyparrhenia*
7. Culm hairy at nodes; lower glume obtuse with long hairs.....3. *Dichanthium*
7. Culm glabrous at nodes; lower glume acuminate, glabrous-short hairs.....1. *Andropogon*

1. Andropogon L., Sp. Pl. 1045. 1753; Gen. Pl. ed. 5: 468. 1754.

1.1. *Andropogon distachyos* L., Sp. Pl. 1046. 1753.
Distribution: N. Cyrenaica.

2. Cymbopogon Spreng., Pugillus 2: 14. 1815.

2.1. *Cymbopogon schoenanthus* (L.) Spreng. Pugillus 2: 15. 1815.
Andropogon schoenanthus L., Sp. Pl. 1046. 1753; *A. laniger* Desf. Fl. Atlant. 2: 379. 1799.
Distribution: Tripolitania [Nalut].

3. Dichanthium Willemet in Usteri; Neue Ann. D. Bot. 18: 11. 1796.

1. Lower glumes of sessile spikelet pitted; inflorescence raceme.....2. *D. foveolatum*
1. Lower glume of sessile spikelet not pitted; inflorescence digitate.....1. *D. annulatum*

3.1. *Dichanthium annulatum* (Forssk.) Stapf in Prain, Fl. Trop. Afr. 9: 178. 1917.
Andropogon annulatum Forssk. Fl. Aegypet-Arab, 173.1775.
Distribution: Tripolitania.

3.2. *Dichanthium foveolatum* (Del.) Roberty in Boissiera 9: 170. 1960.
Andropogon foveolatus Del., in Egypt. Pl. 16m t. f.2. 1812; *Eremopogon fpveolatus* (Del.) Stapf, in Prain, Fl. Trop. Afr. 9: 183. 1917.
Distribution: Fezzan and Hun.

4. Hyparrhenia Andersson ex Fourny Mex. Pl. 2: 51 ex 67. 1886.

4.1. *Hyparrhenia hirta* (L.) Stapf in Prain, Fl. Trop. Afr. 9: 315. 1919.
Andropogon hirtus L., Sp. Pl. 1046. 1753.
Distribution: Tripolitania and N. Cyrenaica.

5. Imperata Cyr., Pl. Rar. Neap. 2: 26, t. 11. 1792.

5.1. *Imperata cylindricus* L. P.Beauv., Ess. Agrost. 165. 1812.
Lagurus cylidircus (L.) Syst. Nat. Ed. 10: 878. 1759; *Saccharum cylindricum* (L.) Lam., Encycl. 1: 594. 1783.
Distribution: Tripolitania, Fezzan, and Ghat.

6. Lasiurus Boiss., Diagn. Pl. Nov. Or. Ser. 2, 4. 145. 1859.

6.1. *Lasiurus hirsutus* (Forssk.) Boiss., Diagn., PL. Or. Ser. 2, 4: 1859.
Distribution: Fezzan.

7. Saccharum L., Sp. Pl. ed. 1:54. 1753; Gen. Pl. ed. 5: 28. 1754.

1. Spikelets awned.....1. *S. ravennae*
1. Spikelet awnless.....2. *S. spontaneum*

7.1. *Saccharum ravennae* (L.) Murr., Syst. Veg. ed. 13: 88. 1774.
Andropogon ravennae L., Sp. Pl. ed. 2: 1481. 1763; *Erianthus ravennae* (L.) P.Beauv., Ess. Agrost. 14. 1812.
Distribution: Tripolitania, Fezzan, and Ghat.
In Libya, this species is represented by ssp. *Parviflorum* (Pilger) H. Scholz, in Willdenowia 6: 291. 1971.

7.2. *Saccharum spontaneum* L., Mant. 2:183. 1771.
Distribution: Fezzan.
In Libya *Saccharum spontaneum* is represented by ssp. *aegyptiacum* (Willd.) Hackel, Monogr. Andropog. 115. 1889.

8. Sorghum Moench, Menth. Pl. 207. 1794, nomen conservatum.

8.1. *Sorghum halepense* (L.) Pers., Syn. Pl. 1: 101. 1805.
Holcus halepe nse L., Sp. Pl. 1753; *Andropogon halepense* (L.) Brotl., Fl. Lusit. 1: 89. 1804.
Distribution: N. Cyrenaica.

TRIBE 4: ARISTIDEAE

Inflorescence an open or contracted dense panicle. Spikelets pedicelate laterally compressed. Lemmas indurate at maturity, awned; awn tripartet. It is represented by 2 genera and 8 species.

1. All branches of the awn glabrous.....1. *Aristida*
1. All branches of the awn or at least the central branch plumose.....2. *Stipagrostis*

1. Aristida L., Sp. Pl. 82. 1753; Gen. Pl. ed. 5: 35. 1754.

1.1. *Aristida adscensionis* L., Sp. Pl. 82. 1753.
Distribution: Tripolitania and N. & S. Cyrenaica.

2. Stipagrostis Nees in Linnaea 7: 290. 1832.

1. Awn with all three branches plumose.....2
1. Awn with only central branch plumose.....3
2. Lower glume longer than the upper one.....7. *S. scoparia*
2. Lower glume shorter than or as long as the upper one.....6. *S. pungens*
3. Culm hairy at the node.....2. *S. ciliate*
3. Culm naked at the node.....4
4. Plumose (central) awn obtuse and not prolonged into naked tip.....5
4. Plumose (central) awn acute and prolonged into naked 6
5. Leaves covered with villous hairs; callus bifid.....3. *S. foexiana*
5. Leaves glabrous; callus not bifid.....4. *S. obtuse*
6. Plumose (central) awn 15mm or less long.....1. *S. acutiflora*
6. Plumose (central) awn much longer.....5. *S. plumosa*

2.1. *Stipagrostis acutiflora* (Trin. et Rupr.) et Winter, in Kirkia 3: 133. 1963
Aristida acutiflora Trin. et Rupr., in Me'm. Acad. Imp. Sci. Pe'tersbourg, Se'r. Math., Second Pt. Sci. Nat. 5: 167. 1842.
Distribution: Tripolitania, S. Cyrenaica, Fazzen, and Jabel Uwainat.
Subsp. *algeriensis* (Henord) H. Scholz, in Osterr. Bot. Z. 117: 286. 1969; Scholz, in Willdenowia 7: 445. 1974.
This subsp. differs from subsp. *acutiflora* by having lower glume densely pubescent. It was reported only from Fezzan.

2.2. *Stipagrostis ciliate* (Desf.) de Winter in Kirkia 3: 133. 1963.
Aristida ciliate Desf., in Schrad. Neues J. Bot. 3:255. 1809.
Distribution: Tripolitania.

3.3. *Stipagrostis foexiana* (Maire et Wilczek) de Winter in Kirkia 3: 134. 1963.
Aristida foexiana Maire et Wilczek in Bull. Soc. Hirst. Nat. Afr. Du Nord 25: 322. 1934.
Distribution: Tripolitania and Fezzan.

2.4. *Stipagrostis obtusa* (Delile) Nees in Linnaea 7: 293. 1832.
Aristida obtuse Del. Fl. Egypt. Expl. Pl. 13, t. 13, 3: 31. 1813.
Distribution: Tripolitania.
This species grows mainly in arid and sandy habitat. Therefore, it is very important grass as a forage for grazing livestock.

2.5. *Stipagrostis plumose* (L.) Munro ex T. Anders., in J. Linn. Soc. B5, suppl. 1: 40. 1860.
Aristida plumose L. Sp. Pl. ed. 2, 2:1666. 1762.
Distribution: Tripolitania, N. Cyrenaica, and Fezzan.

2.6. *Stipagrostis pungens* (Desf.) de Winter in Kirkia 3: 135. 1963.
Aristida pungens Desf., Fl. Atlant. 1: 109, t. 35. 1798.
Distribution: Tripolitania, N. Cyrenaica, Fezzan, and Ghat.
This species is very useful as a sand binder.

2.7. *Stipagrostis scoparia* (Trin. et Rupr) de Winter in Kirkia 3: 133. 1963.
Aristida scoparia Trin. et Rupr. in Me'm. Acad. Imp. Sci. Petersbourg, Se'r. 6, 7: 176. 1849.
Distribution: Tripolitania and Fezzan.

TRIBE 5: ARUDINEAE

Reed-like grasses with broad leaves. Inflorescence an open or contracted panicle. Spikelets with 2-10 florets; glumes equal-subequal; lower lemma 3-nerves. It is represented by 2 genera and 2 species.

Key to the genera

1. Lemma villous on dorsal surface; rachilla glabrous.....1. *Arundo*

1. Lemma glabrous on dorsal surface; rachilla villous.....2. *Phragmites*

1. Arundo L., Sp. Pl. 81. 1753; Gen. Pl. ed. 5: 35. 1754.

Arundo donex L., Sp.Pl. 81. 1753.
Donax arundinaceous P. Beauv. Ess. Agrost. 161. 1812; *Arundo bifaria* Retz. Obs. Bot. 4: 21. 1786; *A. bengalensis* Retz. Obs. Bot. 5: 20. 1799.
Distribution: Tripolitania, N. Cyrenaica, and Fezzan.
It is introduced species.

2. Phragmites Adans. Fam. Pl. 2: 34. 559. 1765.

2.1. *Phragmites australis* (Cav.) Trin. Ex Stend. Nom. Bot. Ed. 2, 2: 324. 1841.
Arundo phragmites L. Sp. Pl. 81. 1753; *A. vulgaris* Lam. Fl. Fr. 3: 615. 1778; *A. australis* Cav. Anal. Hist. Nat. 1: 100. 1799; *Phragmites communis* Trin. Fund. Agrost. 134. 1820.
Distribution: Tripolitania, N. Cyerinaica, and Fezzan.
This species grows well in ponds and streams, its leaves are used as fodder and making mats and baskets. In addition to that, other articlesm, such as pens and arrows used to be made of it.

TRIBE 6: AVENEAE

Annual or perennial. Inflorescence an open or contracted panicle; spikelets with 2-many florets; glumes awnless, longer than the first floret, sometimes longer than the entire spikelet. It is represented by 8 genera and 17 species.

Key to the genera

1. Inflorescence an open panicle.....2
1. Inflorescence contracted panicle.....4
2. Awn with a distinct ring of hairs in the middle.....5. *Corynephorus*
2. Awn not as above.....3
3. Spikelets large 10-more mm long; glumes with 5-9 nerves.....4. *Avena*
3. Spikelets much less than 10 mm long; glumes with 1-3 nerves.....1. *Aira*
4. Lemma with long central awn and two short lateral awns.....8. *Triseteria*
4. Lemma not as above.....5
5. Lemma awnless.....7. *Schismus*
5. Lemma awned.....6
6. Glumes unequal.....3. *Avellinia*
6. Glumes equal-subequal.....7
7. Lemmas villous along nerves; ligule a row of hairs.....2. *Astenatherum*
7. Lemmas glabrous-minutely scabrous but not never villous; ligule membranous.....6. *Lophochloa*

1. Aira L., Sp. Pl. ed. 1:63.1753; Gen. Pl. ed. 5: 31. 1753.

1. Inflorescence with terminal branches equal and dichotomous.....2. *A. tenorii*
1. Inflorescence with terminal branches unequal and not dichotomous.....1. *A. cupaniana*

1.1. *Aira cupaniana* Guss., Fl. Syn. N. 1:148. 1842.
Distribution: N. Cyrenaica.

1.2. *Aira tenorii* Guss., Fl. Sci. Prodr. 1: 62. 1827.
Aira pulchella Link, Hort. Berol. 1: 30. 1827.
Distribution: N. Cyrenaica.

2. Asthenatherum Nevski, in Acta Univ. As. Med. Ser. 8b, Bot. fasc. 17: 8. 1934.

Asthenatherum foerskalii (Vahl.) Nevski in Act. Univ. As.Med. Ser. 8b, Sb, Bot. fasc. 17: 8. 1934.
Avena foerskalii Vahl., Symb. Bot. 2: 25. 1791; *Danthonia foerskalii* (Vahl.) R.Br. in Denh. And Clapp.
Distribution: Tripolitania, N. Cyrenaica, Fezzan, and Jabel Uwainat.

3. Avellinia Parl., Pl. Neuv. 59. 1842.
A monotypic genus.

Avellinia michelii (Savi)., Pl. Nouv., 59. 1842.
Bromus michelii Savi, Bot. Etr. 1: 78. 1808; *Koeleria michelii* (Savi) Coss. Et. Durand, Expl. Sc. Alg. 2: 120. 1855.
Distribution: Tripolitania.

4. Avena L., Sp.Pl ed. 1:79. 1753; Gen. Pl. ed. 5: 34. 1654.

1. Callus 5-7 mm long.....3. *A. longiglumis*
1. Callus shorter.....2
2. Lemma with two fine apical awns and one dorsal awn.....1. *A. barbata*
2. Lemma with dorsal awn only.....3
3. Lemma with long spreading hair on the base.....4
3. Lemma glabrous.....4. **A. sativa*
4. All florets with kneed (curved) awn at the back.....2. *A. fatua*
4. Not all florets with kneed awn (only the lowermost florets awned).....5. *A. sterilis*

4. 1. *Avena barbata* Pott ex Link in Schrad., J. fur Botanik, 2: 314. 1799.
Distribution: Tripolitania and N. Cyrenaica.

4.2. *Avena fatua* L., Sp. Pl. ed. 1: 80. 1753.
Distribution: Tripolitania and N. Cyrenaica.

4.3. *Avena longiglumes* Durieu, in Duchartre, Rev. Bot. 1: 359. 1845.
Distribution: Tripolitania.

4.4. **Avena sativa* L., Sp. Pl. ed. 1: 79. 1753.
Distribution: Tripolitania, N. Cyrenaica, and Fezzan.
This species is very important cultivated grass, which can be used in different purposes, however, in Libya it is used only as a fodder.

4.5. *Avena sterilis* L., Sp. Pl. ed. 2: 118. 1762.
Distribution: Tripolitania and N. Cyrenaica.

5. Corynephorus P. Beauv., Ess. Agrost. 90 t. fig. 2. 1812.

5.1. *Corynephorus divaricatus* (Pourr.) Breistr, in Proc. Verb. Soc. Dauph. Etud. Biol. Grenoble, Ser. 3, 17: 3. 1950.
Aira divaricate Pourr. In Mem. Acad. Toul. 3: 307. 1877; *A. artticulata* Desf., Fl. Atlant. 1: 70.1798. *Corynephorus articulates* (Desf.) P. Beauv., Ess. Agrost. 159. 1812.
Distribution: Tripolitania and N. Cyrenaica.

6. Lophochloa Reichb., Fl. Germ. Excurs. 42. 1830.

1. Glumes unequale, the upper glume twise as long as the lower glume.....2
1. Glumes subequale. The upper glme not as above.....3

2. Lower glume 1-nerved.....1. *L. cristata*
2. Lower glume 3-nerved.....3. *L. rohlfsii*
3. Culm glabrous.....2. *L. pumila*
3. Culm hairy below nodes.....4. *L. salzamannii*

6.1. *Lophochloa cristata* (L.) Hyl., Nord Karlvaxtfl. 1: 283. 1953.
Festuca cristata L., Sp. Pl. 76. 1753; *F. phlaoides* Vill. Flor. Delph. 7: 1786; *Koeleria phleoides* (Vill.) Pers. Syn. 1:97. 1805; *Rostaria cristata* (L.) Kerguelen, in Lejeunia N. S. 75. 273. 1975.
Distribution: Tripolitania, N. Cyrenaica and Fezzan.

6.2. *Lophochloa pumila* (Desf.) Bor. Grass. Burm. Ceyl. Ind. Pak. 445. 1960.
Avena pumila Desf., Fl. Atlant. 1:103.1798; *Trisetum pumilum* (Desf.) Kunth. Rev. Gram. 1:102.1829; *T. pumila* (Desf.) Maire in Bull. Soc. Nat. Afr. Nord. 33. 93. 1942; *Koeleria pumila* (Desf.) Domin, in Biblioth. Bot. 65.288.1907. Maire in Bull. Soc. Nat. Afr. Nord. 33. 93. 1942.
Distribution: Tripolitania and Ghat.

6.3. *Lophochloa rohlfsii* (Ascherson) H. Scholz in Willdenowia, 6: 292. 1971.
Trisetum rohlfsii Ascherson in Verh. Bot. Vereins Prov. Brandenburg 21: 71. 1880; *Koeleria rohlfsii* (Ascherson) Murb. In Acta. Univ. Lund. 36: 16.1900.
Distribution: Tripolitania, Feezan and Ghat.

6.4. *Lophochloa salzmannii* (Boiss.) H. Scholz in Willdenowia 6: 292. 1971.
Koeleria salzamannii Boiss. et Reuter, Pugillus, Pl. Afr. Bot. 123. 1852; *K. pubescens* (Lam.) P.Beauv. ssp. *Salzmannii* (Boiss & Reuter) Traubut in Bull. Soc. Bot. France 34: 394. 1887.
Distribution: Tripolitania and N. Cyrenaica.

7. Schismus P. Beauv., Ess. Agrost. 73. T. 15. Fig. 4. 1812.

1. Lobes of the lowest lemma acuminate; tip of the palea reaching the base of the fissure of the lowest lemma....1. *S. arabic*us
1. Lobes of the lowest lemma obtus-acute; tip of the palea exceeding the base of the fissure of the lowest lemma..2. *S. barbatus*

7.1. *Schismus arabicus* Nees, Fl. Afr. Austr. 1: 422. 1841.
S. spectabilis Figari and De Not. In Mem. Accad. Sci. Torino 12: 255. 1852; *S. calycinus* var. *arabicus* (Nees) Bonnet in Bonnet and Barratte, Cat. Pl. Expl. Sci. Tunisia 475. 1896; *S. barbatus* (L.) Thell. Ssp. arabicus (Nees) Maire and Weiller i in Bull. Soc. Hist. Nat. Afri-que N. 30: 310. 1939.
Distribution: Tripolitania and N. Cyrenaica.

7.2. *Schismus barbatus* (L.) Thell. In Bull. Herb. Boissier, Ser. 2, 7: 391. 1907.
Festuca babata L., Amoen. Acad. 3: 400.1756; *F. calycina* L., Sp. Pl. ed. 2: 110. 1762; *Schimus calycinus* (Loelf.) C. Koch in Linnaea 21: 397.1848.
Distribution: Tripolitania and N. Cyrenaica.

8. Trisetaria Forsk., Fl. Aegypt-Arab. 27. 1775.

8.1. *Trisetaria macrochaeta* (Boiss.) Maire, in Bull. Soc. Hist. Nat. Afr. Nord. 33: 92. 1942.
Trisetum macrochaetum Boiss., Diagn. Ser. 1, 13: 48. 1854.
Distribution: Tripolitania and N. Cyrenaica.

TRIBE 7: CHLORIDEAE

Annual or perennial. Leaves linear-hasitate. Inflorescences digitat panicle with 2-many spikelets; spikelets arranged along the rachis, awned-awnless with 1-many florets. It is represented by 2 genera and 3 species with new recorded species (marked with an asterisk).

Key to the genera

1. Spikelets with one floret, awnless.....2. *Cynodon*
1. Spikelets with 2-4 or more florets, awned .....1. *Chloris*

1. Chloris Swartz, Prodr. Veg. Ind. Occ. 25.1788.

1. Annual grass; spikelets with 2 awns; lemma of frtile floret hairy on the upper margins.....2. *Chloris virgate*

1. Perrenail grass; spikelets with only 1 awn; lemma of fertile floret not as above .....1. *Chloris gayana*

1.1. **Chloris gayana* Kunth, Re'v. Gram. 1:293. Tab. 58.1830.
Chloris abyssinica Hochst. ex A. Rich
Distribution: Fazzan
This species is cultivated as a pasture grass in southern parts of Libya, recently it is naturlised throughout many parts of Tripolitania.

1.2. *Chloris virgate* Swartz, Fl. Ind. Occ. 1:203. 1797.
Distribution: Ghat.
This species grows well in arid and saline areas; it is also very good forage grass.

2. Cynodon Rich in Pers., Syn. Pl. 1:85.1805.

2.1. *Cynodon dactylon* (L.) Pers., Syn. Pl. 1:85.1805.
Panicum dactylon L., Sp. Pl. 58.1753.
Distribution: All over the country.
This species is very common grass, used as fodder.

TRIBE 8: ERAGROSTIDEAE

Inflorescence an open, spike or digitat panicle. Spikelets with 2-several florets; glumes unequal or subequal, awnless. Lemma bifid at apex, 3-nerved, keeled. It is represented by 5 genera and 9 species.

1. Inflorescence an open panicle.....5. Eragrosts
1. Inflorescence spike or digitate panicle.....2
2. Spikes digitate-subdigitate.....3
2. Spikes not as above.....4
3. Rachis prolonged beyond terminal spikelet; glumes mucranet.....1. Dactyloctenium
3. Rachis not prolonged beyond terminal spikelet; glumes not acuminate.....4. Eleusine
4. Spikes appressed and each spike arranged on a node of axis; glumes unequal.....2. Desmostachya
4. Spikes not appressed and arranged alternate or oppsite a long flat axis; glumes subequal.....3. Dinebra

1. Dactyloctenium Willd., Enum. Pl. Hort. Berol. 1029.1809.

1.1. *Dactyloctenium aegyptium* (L.) P. Beauv., Ess. Agrost. 15.1812.
Cynosurus aegyptius L., Sp. Pl. 72.1753; *D. aegyptiacum* (L.) Willd., Enum. Hort. Berol. 2:1029.1809;
D. aegyptium (L.) Asch. & Schw., 3. Fl. Egypt. 171. 1889.
Distribution: Jabel Uwainat.
This species is a common weed in shady and moist areas especially in warm months. It has a little fodder value.

2. Desmotachya Stapf. In Dyer, Fl. Cap. 7:632.1900.
A monotypic genus.

2.1. *Desmotachya bipinnata* (L.) Stapf. In Dyer, Fl. Cap. 7:632.1900.
Briza bipinata L., Syn. Nat., ed. 10, 2:875.1759; *Uniola bipinnata* (L.) L., Sp. Pl. ed. 1:104. 1762; *Eragrostis cynosuroides* (Retz.) P. Beauv., Ess. Agrost. 162. 1812; *Stapfiola bipinnata* (L.) O. Ktzein in Post. & O. Ketz, Lexic. Gen. Pham. 532. 1903; *Poa cynosuroids* Retz. Obs. Bot. 4:20.1786; *Eragrostis bipinnata* (L.) K. Schum. In Engl. Planzenw. Ost. Afr. C: 113.1895.
Distribution: Ghat and Fezzan.
This species is common in sandy soil and has little fodder value. In addation to that, other items such as ropes and baskets are made from its leaves.

3. Dinebra Jacq. Fragm. 3: t. 121.f. 1:77.1809.
A monotypic genus.

3.1. *Dinebra retroflexa* (Vahl) Panz. In Denschr. Akad. Wiss. Munchen.1813: 270. 1814.
Cynosurus retroflexus Vahl, Symb. Bot. 2: 20. 1791.
Didtribution: N. Cyrenaica.
This species is not common weed in Libya and it has no economic value at all.

4. Eleusine Gaertn., Fruct. Sem. Pl. t. 1. 1789.

1. Spikelets 8-10 mm wide.....1. *E. coracana*
1. Spikelets 3-6 mm wide.....2. *E. indica*

4.1. *Eleusine coracana* (L.) Gaertn., Fruct. Sem. Pl. 1:8, t. 1, fig. 11.1789.
Cynosurus coracanus L., Syst. Nat. ed. 10, 2: 875. 1759.
Distribution: Tripolitania and Fezzan.
This species is cultivated sometimes as a fodder grass in the southern parts of Libya.

4.2. *Eleusine indica* (L.) Gaertn., Fruct. Sem. Pl. 1:8. 1789.
Cynosurus indicus L., Sp. Pl. 72. 1753.
Distribution: Tripolitania.
This species is a very good forage grass.

5. Eragrostis Walf. Gen. Pl. Vocab. Char. Def. 23.1778.

1. Lowest panicle branches pilose in the axile, 3 or more branches on node; .....4. *E. pilosa*
1. Lowest panicle branches not pilose in the axile, less than 3 branches on node; 2
2. Leaf blades glandular on the margins; Spikelets 2 mm or more wide; .....3. *E. cilianensis*
2. Leaf blades not glandular on the margins; Spikelets less than 2 mm wide; 3
3. Inflorescence spiciform contracted, terminal on leafy stem .....1. *E. aegyptica*
3. Inflorescence an open panicle, terminal and axillary but not on leafy stem.....2. *E. barrelieri*

5.1. *Eragrostis aegyptica* (Willd.) Link, Hort. Berol. 1:191.1827.
Poa aegyptica Willd., Enum. Pl. Hort. Berol. 2:107.1809.
Distribution: Ghat.

5.2. *Eragrostis barrelieri* Dav. in Morotm J. Bot.8:289.1894.
E. minor acut, non Host, Geam. Austr. 4: 15.1809.
Distribution: Tripolitania, Fezzan and Brak.

5.3. *Eragrostis cilianensis* (All.) Vigna. Lutai Malpighia 18:386.1904.

Poa cilianensis All. Fl. Ped. 2:246.1785; *Poa megastachya* Koel., Descr. Gram. 181. 1802; *E. megastachya* (Koel.) Link, Hort. Berd. 187.1827; *Briza eragrostis* L., Sp.Pl. 70.1753.
Distribution: Tripolitania.

5.4. *Eragrostis pilosa* (L.) P. Beauv., Ess. Agrost. 1621.18.1812.
Poa pilosa L., Sp. Pl. 1:68.1753.
Distribution: Ghat

TRIBE 9: FESTUCEAE

Annual or perennial. Inflorescence spike-like or an open panicle. Spikelets with 2 or more florets, lower florets fertile and upper florets sterile, sometimes with only 1 floret. Both glumes and at least lower glume shorter than the lowest floret, always shorter than the entire spikelet (sometimes absent), awnless. Lemma awned -awnless, when awned then awn at the tip or between teeth. It is represented by 15 genera and 41 species with 2 endemics, and anew reported species (marked with an asterisk).

Key to the genera

1. Spikeles spaced 1 floret; upper glume present, lower glume obsolete-absent except in terminal spikelet.....
.....11. *Psilurus*
1. Spikelets not spaced 2-more florets; both glumes present.....2
2. Spikelets of two kinds, fertile and sterile, arranged in fassicles.....3
2. Spikelets all alike.....4
3. Sterile lemmas awned.....5. *Cynosurus*
3. Sterile lemmas awnless .....,...9. *Lamarakia*
4. Inflorescence dichotomously branched.....4. *Cutandia*
4. Inflorescence not dichotomously branched.....5
5. Florets converted into bulbils at the base.....10. *Poa*
5. Florets not converted into bulbils at the base.....6
6. Spikelets pyramidal in shape; lemmas as wide or wider than long.....1. *Briza*
6. Spikelets not pyramidal in shape; lemma as long or longer than wide.....7
7. Spikelets densely clustered towards the end of branches; glumes ciliate on the keel.....6. *Dactylis*
7. Spikelets not as above; glumes glabrous-scabrous on the keel.....8
8. Lemmas with capitate hairs at the base.....7. *Desmazeria*
8. Lemmas glabrous at the base, if hairy, then not capitate.....9
9. Lemmas awnless.....10
9. Lemmas awned.....13
10. Glumes unequal.....11
10. Glumes equal-subequal.....12
11. Both glumes or at least the lower glume not nerved.....12. *Sphenopus*
11. Both glumes nerved.....10. *Poa*
12. Leaf-sheaths all open.....13
12. At least upper leaf-sheaths closed.....2. *Bromus*
13. Inflorescence spike-like with spikelets erect and appressed or sunken in the rachis.....13. *Trachynia*
13. Inflorescence an open or contracted panicle with spikelets not as above.....14
14. Glumes unequal; lemma awned.....15
14. Glumes equal; lemmas awnless.....3. *Catpodium*
15. Plants perennial; glumes equal-subequal.....8. *Festuca*
15. Plants annuals; glumes unequal.....16
16. Lemmas awned at tip, sikelets not paired.....14. *Vulpia*
16. Lemmas awned from the back or between the teeth; spikelets paired .....15. *Vulpiella*

1. Briza L. Sp. Pl. 70. 1753, Gen. Pl. ed. 5: 32. 1754.

Briza maxima L., Sp. Pl. 70.1753.
Distribution: N. Cyrenaica.

2. Bromus L. Sp. Pl. 76. 1753, Gen. Pl. ed. 33. 1754.

1. Lower glume1-nerved.....2
1. Lower glume 3-nerved.....6
    2. Lemma of mature spikelets 20 mm long or more (excluding awn); awn 30mm long or more; lower glume 15-25mm long, upper glume 20-35 mm long.....3
    2. Lemma of mature spikelets up to 20mm long (excluding awn); awn up to 25mm long; lower glume 5-10 mm long, upper glume 7-15mm long.....4
3. Panicle erect, dense with branches shorter than spikelets (excluding awns).....9. *B. rigidus*
3. Panicle lax, nodding with branches equal or longer than spikeles (excluding awns).....3. *B. diandrus*
    4. Panicle lax; spikelets not densely crowded.....7. *B. madritensis*
    4. Panicle dense; spikelets densely crowded.....5
5. Panicle with more than 10 spikelets, brush-like, usually more than 5cm long (including awns); spikelets 4-more on each branch.....10. *B. rubens*
5. Panicle with 10 spikelets or less, not brush-like, 2.5cm long (including awns); spikelets 1-2 on each branch.....4. *B. fasciculatus*
    6. Spikets laterally compressed.....11. *B. unioloides**
    6. Spikelets not as above.....7
7. Largest spikelets 3cm long or more (excluding awns).....8
7. Largest spikelets up to 2.5cm long (excluding awns).....9
    8. Panicle axis with single spikelet on each node.....2 *B. caroli-henrici*
    8. Panicle axis with 2 spikeets or more on each node.....6. *B. alopecuros*
9. Awns 10 mm long or more.....6. *B. lanceolatus*
9. Awns less than 10mm long.....10
    10. Awns reflexed (curved).....5. *B. intermedius*
    10. Awns erect (straight).....8. *B. molliformis*

2.1. *Bromus alopecuros* Poir., Voyage Barb. 2:100.1789.
    B. alopecuroides Poir. In Lam., Encycl. Suppl. 1:703.1810.
Distribution: N. Cyrenaica.

2.2. *Bromus caroli-henrci* Greuter in Ann. Natuhist. Mus. Wien 75:83.1971.
    B. caroli-henrici ssp. Biaristulatus (Maire) Scholz, in Willdenowia, 7:435.1974; *B. lanceolatus* Roth, ssp. *biaristulatus* Maire in M., Cat. 3429. 1942; *B. alopecuros* Poir. ssp. *caroli-henrici* (Greuter) R. M. Smith, in Bot. J. Lonn. Soc. Lond. 76:360.1978.
Distribution: N. Cyrenaica.

Bromus diandrus Roth in Bot. Abhl. 44.1787.
B. rigidus Roth ssp. gussonii (Parl.) Maire in Jehand. Et Maire, Cat. Moroc. 865.1934; *Anisantha gussonii* Nevski in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17:20.1934; *A. diandra* (Roth) Tutin, Fl. Brit. Isles. ed. 2:1149.1967.
Distribution: Tripolitania.

Bromus fasciculatus C. Presl, Cyp. et Gram. Sic. 39.1820.
B. fasciculatus C. Presl var. *alexandrinus* Thell. In Feddes Rep. 5:161.1908; *B. rubens* L. ssp. *fasciculatus* (Presl) Trabut in Batt. & Trab., Fl. Al. Monocat. 226.1884; *Anisantha* fasciculate (Presl) Nevski in Acta Univ. As. Med. Ser. VIII, Bot. Fasc. 17:21.1934.
Distribution: Tripolitania and N. Cyrenaica

Bromus intermedius Guss., Fl. Sci. Prodr. 1:144.1827.
Distribution: N. Cyrenaica.

Bromus lanceolatus Roth, Cat. Bot. 1:18.1797.
B. macrostachys Desf., Fl. Atl. 1:96. 1798.
Distribution: Tripolitania and N. Cyrenaica.

Bromus madritensis L., Cent. Pl. 1.5.1755.
Zerne madritensis (L.) S. F. Gray, Nat. Arr. Brit. Pl. 2:117.1821; *Anisantha madritensis* (L.) Nevski in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17:21.1934.
Distribution: Tripolitania and N. Cyrenaica.

Bromus molliformis Lloyd, Fl. Loire-Inf. 315.1844.
B. Mollis L. Sp. Pl. ed. 2m 1:112. 1762; *B. hardeaceus* L. ssp. *Molliforms* (Lloyd) Maire et Weiller in Maire, Fl. Afr. Nord. 3:255.1955; *B. hardeaceus* var. *molliformis* f. *villosus* Pamp., Pl. Trip. 16. 1914.
Distribution: Tripolitania and N. Cyrenaica.

Bromus rigidus Roth in Bot. Mag. (Roem & Usteri) 4, 10:21.1790.
B. villosus Forsk., Fl. Aeg. Arab. 23. 1775; *B. villosus* var. *rigidus* (Roth) Aschers. et Graebn. in Syn. Mitt. Fl. 11:596.1901; *B. maximus* Desf., Fl. Atl. 1:95.1798.
Distribution: Tripolitania.

2.10. *Bromus rubens* L., Cent. Pl. 1:5.1755.
Anisantha rubens (L.) Nevski, in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17:19.1934.
Distribution: Tripolitania and N. Cyrenaica.

2.11. **Bromus unioloides* Willd., Hort. Berol. 1.3. t. 3. 1804.
Distribution: Tripolitania.
This species is reported for the first time from Libya by Sherif in 1992 [13].
: Tripolitania and Fezzan.

3. Catapodium Link, Hort. Berol. 1: 44.1845.

1. Inflorescence without secondary branches; spikelets originating from the main axis.....1. *C. marinum*
1. Inflorescence with secondary branches; spikelets originating from the branchesof the main axis.....2. *C. rigidum*

3.1. *Catapodium marinum* (L.) L. E.Hubbard in Kew Bull. 1954. 1955.
Fesuca marinum L., Amoen. Acad. 4:96.1759; *Poa loliacea* Huds., Fl. Angl. 1:43.1762; *Catapodium loliaceum* (Huds.) Link, Hort. Berol. 1:145. 1:145.1827; *C. marinum* ssp. *syrticum* (Ban. Et Murbeck) H. Scholz in Willdenowia 6:291. 1971; 431. 1974.
Distribution: Tripolitania and N. Cyrenaica.

Catapodium rigidum (L.) C.E. Hubbard in Dony, Fl. Bedfordshire, 437.1953.
Poa rigida L., Cent. Pl. 1:5.1755; *Scleropoa rigida* (L.) Griseb., spicil. Fl. Rumel. 2:431.1846.
Distribution: Tripolitania and N. Cyrenaica.

4. Cutandia Willk, Bot. Zeit. 18:130.`1860.

1. Spikelets with 2-3 florets; glumes 1-nerved.....2. *C. memphitica*
1. Spikelets with 6-8 florets; glumes 3-5-nerved.....1. *C. maritima*

4.1. *Cutandia maritima* (L.) Barbey, Fl. Sard. Comp. 72: 1885.
Triticum maritimum L., Sp. Pl. ed. 2:128.1762; *Scleropoa maritima* (L.) Parl., Fl. Ital. 1:468.1850.
Distribution: Tripolitania and N. Cyrenaica.

4.2. *Cutandia memphitica* (Spreng.) Richter, Pl. Europ. 1:77.1890.
Dactylis memphitica Sprengel, Bot. Gart. Halle, Nachtr. 1:20.1801; *C. dichotoma* (Forsskal) Trabut var. *memphitica* (Roth.) Maire et Weiller, Fl. Afr. Nord 3:38.1955; *Scleropoa memphitica* (Spreng.) Parl., Fl. Ital. 1:470. 1848.
Distribution: Tripolitania, N. Cyrenaica, Fezzan and Ghat.

5. Cynosurus L., Sp. Pl. 72.1753, Gen. Pl. ed. 5:33.1754.

1. Peduncle erect below panicle; anthers ovate.....1. *C. coloratus*
1. Peduncle curved below panicle ; anthers oblong-linear.....2. *C. elegans*

5.1. *Cynosurus coloratus* Lem. ex Steud., Nomencl. Bot. ed. 2, 1:465.1840.
Distribution: N. Cyrenaica.

Cynosurus elegans Desf., Fl. Atl. 1:82,t.17.1798.
Distribution: N. Cyrenaica.

6. Dactylis L., Sp. Pl. 71.1753, Gen. Pl. ed. 5:32.1754.

6.1. *Dactylis glomerata* L., Sp. Pl. 1:71.1753.
D. hispanica Roth, Cat. Bot. 1:8.1797; *D. glomerata* var. *hispanica* (Roth) Koch, Syn. Fl. Germ.808.1837; *D. glomerata* ssp. *hispanica* (Roth) Nyman, Consp. 819.1882.
Distribution: Tripolitania and N. Cyrenaica.
This species is considered as a good forage and hay grass.

7. Desmazeria Dumort. Obs. Gram. Belg. 46:1824.

1. Mature spikelets 10 mm long or more, with 6- more florets, lower spikelets pedicelate.....2. *D. philistaea*
1. Mature spikelets 8 mm long or less, with 5 or less florets, all spikelets sessile.....,,.....1. D. lorentii

7.1. *Desmazeria lorentii* H. Scholz in Bot. J. Jahrb. Syst. 94:556.1974.
Distribution: Tripolitania and N. Cyrenaica.

7.2. *Desmazeria philistaea* (Boiss.) H. Scholz, in Willdenowia, 6:291.1971.
Scleropoa philistaea Boiss., Diagn. Pl. Or. Nov. Ser. 1, 13:60.1853; *Cutandia philistaea* (Boiss.) Benth. in J. Linn. Soc. 19:118.1881.
Distribution: Tripolitania and N. Cyrenaica.
In Libya *Desmazeria philistaea* is represented by ssp. *rholfsiana*.

8. Festuca L., Sp. Pl. 73. 1753, Gen. Pl. ed. 5:33.1754.

8.1. *Festuca arundinacea* Schreb., Spicil. Fl. Lips. 57.1771.
F. elatior L. ssp. *arundinacea* (Schreb.) Haek., Monogr. Fest. 156.1882.
Distribution: N. Cyrenaica.
This species is used as pasture grass.

9. Lamarakia Moench, Meth, 201,1794.
A monotypic genus.

9.1. *Lamarakia aurea* (L.) Moench, Meth. 201.1794.
Cynosurus aurea L., Sp. Pl. 73.1753.
Distribution: Tripolitania and N. Cyrenaica.

10. Poa L., Sp. Pl. 67.1753.
This genus includes two endemics (marked with an astresik).

1. Lowermost lemma bearing cobwebby hairs at callus.....2
1. Lowermost lemma not bearing cobwebby hairs at callus.....4
2. Florets converted into bulbils.....2. *P. bulbosa*
2. Florets not converted into bulbis.....3
3. Ligules obtuse or blunt.....5. *P. pratensis*
3. Ligules acute or pointed.....7. *P. trivials*
4. Base of stem bulbous; Perennial.....5
4. Base of stem not bulbous.....6
5. Glumes glabrous, if scabrous, then on the upper part of mid-nerve..... 8. **P. vaginata*
5. Glumes scabrous along mid- and lateral nerves.....6. *P. sinaica*
6. Mature spikelets 3 mm or less long; florets 1-2.....4.**P. pentapolitana*
6. Mature spikelets 3 mm or more long; florets 2-6.....7
7. Anthers 1 mm or more long.....1. *P.annua*
7. Anthers 0.2-0.3 mm long.....3. *P.infirma*

10.1. *Poa annua* L., Sp. Pl. 1:68.1753.
Distribution: Tripolitania and N. Cyrenaica.

10.2. *Poa bulbosa* L., Sp. Pl. 70.1753.
Distribution: N. Cyrenaica.

10.3. *Poa infirma* Kunth in H. B. & K., Nov. Gen. Sp. ed. 1:158.1817.
P. exilis Murb. Ap. Aschers. et Graebn. Syn. Mitteleurop. Fl. 2:389.1900; *P. annua* L. ssp. *exilis* (Tomm.) Aschers. & Graebn., Syn. Mitteleurop. Fl. 2:389.1900.
Distribution: N. Cyrenaica.

10.4. **Poa pentapolitana* H. Scholz in Willdenowia, 6: 292.1971.
Distribution: N. Cyrenaica (JablebAkhdar area).
It is endemic to Libya.

10.5. *Poa pratensis* L., Sp. Pl. 67.1753.
Distribution: Tripolitania.
This species is an exotic species introduced into Tripoli in 1928 (Keith), it is a very good forage grass.

10.6. *Poa sinaica* Steudt., Syn. Pl. Glum. 1:256.1854.
Distribution: N. Mizda.

10.7. *Poa trivialis* L., Sp. PL. 67.1753.
Distribution: Tripolitania and N. Cyrenaica.

10.8. **Poa vaginata* Pamp. In Arch. Bot. 12:20.1936.
Distribution: N. Cyrenaica.
It is endemic to Libya.

11. Psilurus Trin., Fund. Agrost, 93. 1822.
A monotypic genus

11.1. *Psilurus incurvus* (Gouan) Schinz et Thell., in Vierteljahrschr. Nat. Gez. Zurich, 57: 40. 1913.
Nardus incurvus Gouan, Hort. Monspel, 33. 1762; *N. aristata* L., Sp. Pl. ed. 2: 78. 1762; *Psilurus aristatus* (L.) Duval-Jouve in B. Sco. France 13: 132. 1866
Distribution: Tripolitania and N. Cyrenaica

12. Sphenopus Trin., Fund. Agrost. 135.1820.

1. Lemma 3-nerved.....1. *S. divaricatus*
1. Lemma 5-nerved.....2. *S. ehrenbergii*

12.1. *Sphenopus divaricatus* (Gouan) Reichenb., Fl. Germ. Excurs. 45.1830.
Poa divaricate Gouan, Illusr. Obs. Bot. 3:4, p1. 2, f. 1.1773.
Distribution: Tripolitania.

12.2. *Sphenopus ehrenbergii* Hausskn., in Thur. Bot.Vereins 13-14:57.1899.
S. syrticus (Murb.) Trabut in B. et T., Fl. Syn. 377.1902; *S.divaricatus* ssp. *syrticus* Murb., Contr. Tun. 4: 19.1900; *S. divaricatus* (Gouan) Reichenb. var. *ehrenbergii* (Hausskn.) Durand & Barratte, Fl. Lib. Prod. 265.1910.
Distribution: Tripolitania and N. Cyrenaica.

13. Trachynia Link, Hort. Bot. Berol. 1:42.1827.
A monotypic genus.

13.1. *Trachynia distachya* (L.) Link, Hort. Bot. Berol. 1:43.1827.
Bromus distachyos L., Cent. 2:8.1756; *Brachypodium distachyom* (L.) P. Beauv., Ess. Agrost. 101, 155.1812.
Distribution: Tripolitania and N. Cyrenaica.

14. Vulpia C. C. Gemel. Fl. Bad. 1:8.1806.

1. Glumes more or less equal, awned.....4. *V. inops*
1. Glumes very unequal, awnless.....2
2. Lemma densely ciliate, both glumes awnless.....2. *V. ciliate*
2. Lemma not ciliate; only upper glume awned.....3
3. Upper glume (including awn) 3 cm or more long.....3. *V. gracilis*
3. Upper glume (including awn) up to 2.5 cm long.....4
4. Spikelets excluding awns 1.5-6 mm long.....1. *V. bromoides*
4. Spikelets excluding awns 9-10 mm long.....5. *V. membranacea*

14.1. *Vulpia bromoides* (L.) S. F. Gry, Nat. Arr. Brit. P 124:18221.
Festuca bromoids L., Sp. Pl. ed. 1:75.1753; *Vulpia dertomensis* (All.) Gola, in Malpighia 18: 266.1904; *V. myuros* ssp. *sciuroides* (Roth) Rauy, Fl/ Fr. 14:256; *Festuca sciuroides* Roth, Cat. Bot. 2:11.1800.
Distribution: N. Cyrenaica.

14.2. *Vulpia cilita* Dumort, Obs. Gram. Belg. 100.1824.
Festuca cilita Danth. ex Lam. & DC., Fl. Fr. ed. 3, 3:55.1805; *Vulpia danthonii* (Asch. et Grb.) Volkart in Schinz et Kell., Fl. Schw. ed. 2:57.1905.
Distribution: Tripolitania.

14.3. *Vulpia gracilis* H. Scholz in Willdenowia 5:109.1968.
V. uniglumis acut, non (Soland.) Dumort. Obs. Gram. Fl. Belg. 101.1823.
Distribution: Tripolitania.

14.4. *Vulpia inops* (Del.) Hackel in Flora, 63:467.1880.
Festuca inops Del., Fl. Egy. T. 63.1824; *Vulpia brevis* Boiss. et Kotschy, ex Boiss. Diag. Ser. 2.4:139.1859.
Distribution: Tripolitania and N. Cyrenaica.

14.5. *Vulpia membranacea* (L.) Dumort. Agrost. Belg. 100.1824.
Stipa membranacea L., Sp. Pl. 560.1753; *Vulpia uniglumis* (Ait.) Dumort., Agrost. Belg. 100.1824; *Festuca uniglumis* Ait., Hort. Kew, 108.1789; *Vulpia fasciculata* (Forssk.) Fritsch., Excfl. Osterr. ed. 3:674.1922.
Distribution: Tripolitania.

15. Vulpiella (Battand & Trabut) Andreanzky, Ind. Hort. Bot. Univ. Budapest 95.1934.
A monotypic genus.

15.1. *Vulpiella tenuis* (Tineo) Kerguelen, Fl. Europ.1977.
Bromus tenuis Tineo, Pl. Rar. Sic. Pug. 1:3.1817; *Festuca incrassate* Salzm. Ex Loisel., Fl. Gall. ed. 2, 11:85.1828; *Vulpia incrassata* Parl., Ann. Sc. 2, 15:298.1841; *Cutandia incrassata* (Salzm.) Benth. in J. Linn. Soc. 19:118.1881; *Vulpia lutoureuxii* Aschers. In Durand & Barratte, l.c. 270; *Vulpiella incrassate* (Salzm.) Andreanszky, Ind. Hort Bot Univ. Budapest 95:134.1934.
Distribution: Tripolitania and N. Cyrenaica.

TRIBE 10: HORDEAE

Annual-Perennial. Inflorescence spike with spikelets sessile-subsessile sometimes embedded into rachis, terminal. Spikelets 1-4 on node with 1-many florets. Represented by 7 genera and 20 species.

Key to the genera

1. Spikelets in clusters of 2 or more on each node of the axis.....2
1. Spikelets solitary at each node of the axis.....3
2. Spikelets in clusters of 2 at node, each with 2 florets.....2. Crithopsis
2. Spikelets in clusters of 3 at node, each with only one floret.....5. Hordeum
3. Spikelets arranged edgewise along the rachis; only upper glume present.....6. Lolium
3. Spikelets arranged flatly or laterally along the rachis; both glumes present.....4
4. Spikelets cylinricle, fitting into depressions or pockets of the rachis.....1. Aegilops
4. Spikelets not as above.....5
5. Lammas awnless.....3. Elytrigia
5. Lammas awned.....6
6. Glumes unequal.....4. Gaudini
6. Glumes equal-subequal.....7. Triticum

1. Aegilops L., Sp. Pl. 1050, 1753, Gen. Pl. ed. 5: 470.1754.
The genus *Aegilops* is considered as an ancestor of the genus *triticum*.

1. Spike excluding awns 10 times or more longer than wide; glumes awnless.....5. *A. ventricosa*
1. Spike excluding awns 5 times-less long; glumes awned.....2
2. Glumes with narrow nerves, equally broad or parallel.....2. *A. kotschyi*
2. Glumes with nerves unequal broad, not parallel.....3
3. Glumes with 4 or more awns.....1. *A. geniculate*
3. Glumes with 3 or less awns.....4
4. Spike excluding awns 4 cm long or more..... .....4. *A. triuncialis*

4. Spike excluding awns 2-3 cm long.....3. *A. neglecta*

Aegilops geniculate Roth, Bot. Abhl. 45.1787.
A. Geniculate var. *Africana* (Eigg, H. Scholz) l.c. 420.1974; *A. ovata* L., Sp. Pl. 1050.1753; *A. ovata* var. *Africana* Eig, Monogr. 144.1929; *Triticum ovatum* (L.) Gren & Godram, Fl. Gr. 3.601:1856.
Distribution: Tripolitania.

Aegilops kotschyi Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7:129.1846.
A. Ovata var. *triaristata* acut. Non willd. 1805.
Distribution: Tripolitania and N. Cyrenaica.

Aegilops neglecta Req. ex Bertol., Fl. Stal. 1:787.1834.
A. ovata Roth in Bot. Abh. Beub. 47.1787.1753; *A. triaristata* Willd., Sp. Pl. ed. 3,4:743.1805; *Triticum neglectum* (Reg. ex Berol.) Greuter in Boissiera 13:171.1967.
Distribution: Tripolitania and N. Cyrenaica.

Aegilops triuncialis L., Sp. Pl. 1051.1753.
Distribution: N. Cyrenaica.

Aegiloips ventricosa Tausch., in Flora 20:108.1837.
Distribution: Tripolitania and N. Cyrenaica.

2. Crithopsis Jaub. Et Spach, Ill. Pl. Or. 4:30, t. 321.1857.
A monotypic genus.

2.1. *Crithopsis delileana* (Schultes) Rozhev., Graser, 319.1937.
Elymus geniculatus Delile, Fl. Egypt 30, t. 13f. 1.1812 non Curtis. 1790; *E. delileanus* Schultus, Syst. Veg. ed. 15,2. Mant.: 424.1824.
Distribution: N. Cyrenaica.

3. Elytrigia Desv. in Nouv. Bull. Sco. Philom. 2:191.1810.

3.1. *Elytrigia junceae* (L.) Nevski in Acta Inst. Bot. Acad. Sci. USSR. 1.2:83.1936.
Triticum junceum L., Amoen. Acad. 4:266.1759; *Agropyron junceum* (L.) P. Beauv., Ess. Agros. 102, 146.1812.
Distribution: Tripolitania.

4. Gaudinia P.Beauv., Ess. Agrost. 95.1812.

4.1. *Gaudinia fragilis* (L.) P. Beauv. Ess. Agrost. 95.164.1812.
Avena fragilis L., Sp. Pl. ed. 1:80.1753.
Distribution: Tripolitania and N. Cyrenaica.

5. Hordeum L., Sp. Pl. 84.1753, Gen. Pl. ed. 5:37.1754.
Taxon marked with an asterisk (*) is known only from cultivation in Libya.

1. Perennial plants; culm bulbous at the base.....1. *H. bulbosum*
1. Annual plants; culm not bulbous at base.....2
2. Inflorescence panicle with strong rachis, mostly cultivated species.....5. *H. vulgare**
2. Inflorescence panicle with fragile rachis., wild species.....3
3. Awn of central lemma stout 5-15 cm long.....4. *H. spontaneum*
3. Awn of central lemma not stout up to 3.5 cm long.....4

4. Glumes of central spikelets ciliate at margins.....3. *H. murinum*
4. Glumes of central spikelets not ciliate at margins.....2. *H. marinum*

5.1. *Hordeum bulbosum* L., Amoen, Acad. 4:304.1759.
H. strictum Desf., Fl. Atl. 1:113, t. 37.1798.
Distribution: N. Cyrenaica.

5.2. *Hordeum marinum* Huds., Fl. Angl. ed. 2, 1:57.1778.
H. maritimum With., Nat. Arr. Brit. Pl. ed. 2, 1:127.1787.
Distribution: N. Cyrenaica.

5.3. *Hordeum murinum* L., Sp. Pl. 85.1753.
Distribution: Tripolitania.

5.4. *Hordeum spontaneum* C. Koch in Linn. 21:430.1848.
H. distichon L. var. *spontaneum* (C. Koch) Ascherson et Schweinf. In Bull. Herb. Boiss. 1:677.1893.
Distribution: N. Cyrenaica.

5.5. **Hordeum vulgare* L., Sp. Pl. 84.1753.
H. hexastichon L., Sp. Pl. 85.1753; *H.sativum* Pres., Syn. Pl. 1: 108.1805.
Distribution: All over the country.
This species is cultivated all over the country. It is used for making bread and other local meals, however, now day's bread is making from wheat instead of barley.

6. Lolium L., Sp. Pl. 83.1753, Gen. Pl. ed. 5:36.1754.

1. Lower glume as long as or longer than spikelets.....1. *L. loliaceum*
1. Lower glume shorter than spikelets.....2
2. Spiketes with 11-22 florets; lemmas usually awned, awns up to 15 mm long.....2. *L. multiforum*
2. Spikelets with less than 11 florets; lemmas awned-awnless, when awned, then awn8 mm long or less.....3
3. Plants perennial; lemmas usually awnless, if awned, thenawns 4-8 mm long.....3. *L. Perenne*
3. Plants annual; lemmas awned, awns 1-2 mm long.....4. *L. rigidium*

6.1. *Lolium loliaceum* (Bory & Chaub) Hand Mazz. In Ann. Nat. Hofmus. Wien 28:32.1914.
Rottboellia loliaceae Bory & Chaub., Exped. Sc. Moree 3:46.1832; *Lolium subulatum* Vis., Fl. Dalm. 1:90.t. 3.1842;
L. Rigidium Gaud. Var. *rottboelloides* Heldr., ex Boiss., Fl. Or. 5:680.1884.
Distribution: N. Cyrenaica.

6.2. *Lolium multiforum* Lam., Fl. France. 3:621.1778.
L. italicum A .Braun in Fl. 17:259.1834; *L. rigidium* Parl., Fl. Ital. 1:532.1848.
Distribution: Tripolitania & Fezzan.
This species is highly polymorphic and hybridizes in nature with species of the genus *Festuca*.

6.3. *Lolium perenne* L., Sp. Pl. 83.1753.
L. marschallii Steven in Bull. Soc. Nat. Mosc. 30:103.1857.
Distribution: N. Cyrenaica.
Tis species is highly polymorphic and hybridizes in nature with other species of the genus *Lolium* as well as with species of the genus *Festuca*.

6.4. *Lolium rigidium* Gaud. Agrost. Helvet. 1:334.1811.
Distribution: Tripolitania and N. Cyrenaica.

It is very common and widely distributed species in Libya.

7. Triticum L., Sp. Pl. 85.1753; Gen. Pl. ed. 5:37.1754.
Taxa marked with an asterisk (*) are known only from cultivation in Libya.

1. Spike axis weak, breaking at maturity.....2. *T. bicornis*
1. Spike axis strong,l not breaking at maturity.....2
2. Spikes 3-4 times as long as broad.....3. *T. compactum**
2. Spike much longer.....1. *T. aestivum**

7.1. **Triticum aestivum* L., Sp. Pl. ed. 1:85.1753.
T. hybernum L., Sp. Pl. 86.1753; *T. sativum* Lam., Fl. Fr. 3:625.1778; *T. vulgare* Vill., Hist. Pl. Dauph. 2:153.1787; *T. Segetale* Salisb., Prodr. Stirp. 27.1789; *T. vavilovi* (Tuman) Jacubz ex Zhuk., La Turquie Agricole 705, 805, f. 379-381.1933.
Distribution: All over the country.

7.2. *Triticum bicornis* Forssk., Fl. Aeg.- Arab 26.1776.
Aegilops bicornis (Forssk.) Jaub. et Spach, Illustr. Fl. Or. 4: t. 309.10.1850.
Distribution: N. Cyrenaica.
This species used to be treated under the genus *Aegilops* by Durand & Barratte [4], but in the present study it is treated under the genus *Triticum* due to characteristic features of the glumes as being keeled, whereas, glumes in *Aegilops* are not keeled.

7.3. **Triticum compactum* Host, Gram. Austr. 4:4, t.7.1809.
T. vulgare L. var. *compactum* (Host) Alef., Landnw. Fl. 327.1866.
Distribution: N. Cyrenaica.
This species grows well on poor soils and it is good for making bread.

Tribe 11: LYGEAE
Perennial with strong rhizome. Inflorescence solitary, terminal enclosed within a spathe-like sheath. Spikelets with 2 florets; glumes absent; lemma ciliate, smaller than peal. It is represented by only 1 genus and 1 species.

1. Lygeum Loefl. ex Linn., Gen. Pl. ed. 5:27.1754.
A monotypic genus.

Lygeum spartum Loefl. ex Linn., Gen, Pl. ed. 5, addendum, pag. ult., Post. ind. 1754.
Distribution: Tripolitania.
This species is used for making rope, bags, sacks, and mats as well as stuffing mattresses.

TRIBE 12: MELICEAE
Spikelets with 2 florets; terminal floret sterile and club-shaped. Only 1 species reported from Libya.

1. Melica L., Sp. Pl. 66.1753, Gen. Pl. ed. 5:31.1754.

11.1. *Melica minuta* L., Manth. 32.1767.
M. ramose Vill., Hist. Pl. Dauph. 2:91.1787; *M. Cyrenaica* Viv., Fl. Lib. Spc. 4.1824; *M. minuta* L. var. *cyrenaica* Maire et Weiller, in Maroc Cat. 2865. 1939.
Distribution: N. Cyrenaica.

TRIBE 13: MILIEAE
Spikelet dorsally compressed with one floret, awnless; lemma indurate at maturity, sterile lemma wanting. It is represented by 1 species.

1. Millium L., Sp. Pl. ed. 1: 61. 1753; Gen. Pl. ed. 5: 30. 1754.

6.1. *Millium vernale* M. Bieb., Fl. Taur. – Cave. 1:53.1808.
M. montianum Parl., Fl. Ital. 1: 156. 1848.
Distribution: N. Cyrenaica.

TRIBE 14: Paniceae

Annual or perennial. Inflorescence an open or contracted panicle, sometimes spike, digited, or racemose; Spikelets in some genera subtended by stout bristles or spines, with two florets, lower floret empty or sterile, and upper floret fertile; lemma of fertile floret indurate, awnless. It is represented by 8 genera and 16 species with a new generic recorded for the Libyan grasses by Siddiqi [16] in 1992 [Marked with an asterisk].

Key to the genera

1. Spiketlets subtended by bristles or spines.....2
1. Spikelets not subtended by bristles or spines.....4
2. Bristles or spines united at the base forming a spine bur.....1. Cenchrus
2. Bristles or spines not united at the base, distinct and free.....3
3. Spikelets and bristles falling together as one unite; plants perennial.....7. Pennisetum
3. Spikelets falling free from bristles; plants annual.....8. Seteria
4. Spikelets crowded in rows or fassicles on unbranched rachis.....5
4. Spikelets solitary or paired in panicle or spicate racemes.....6
5. Spikelts with conspicuous ring-like or .disc at the base; lower glume absent.....4. Eriochloa*
5. Spikelts without ring-like or disc at the base; both glumes prominent.....3. Echinochloa
6. Spikelets arranged on flattened rachis; spikes solitary, digitate, or racemouse.....7
6. Spikelets not arranged on flattened rachis; spikes an open or contracted panicle.....5. Panicum
7. Spikeles lanceolate-elliptical.....2. Digitaria
7. Spikelets plano-convex.....6. Paspalum

1. Cenchrus L., Sp. Pl. 1049.1753; Gen. Pl. ed. 5:470.1754.

1. Bur lacking stiff spines with flattened base; plants perennial.....1. *C. Ciliaris*
1. Bur contains stiff spines with flattened base; plants annual.....2. *C. incertus*

Cenchrus ciliaris L., Mant. Alt. 2.302.1771.
Pennisetum ciliaris (L.) Link, Hort. Berol. 1:213.1827.
Distribution: Tripolitania.

Cenchrus incertus M.A.Curtis, Boston J. Nat. Hist. 1:135.1837.
C. pauciflours Bent. Bot. Voy. Sulph. 56.1844.
Distribution: Tripolitania.

2. Digitaria Haller, Hist. Strip. 2:244.1768.

1. Lemma of sterile lower floret densly villous on margins; leaf blades glabrous-sparsely pubescent...1. *D. bicornis*
1. Lemma of sterile lower floret scabrous but never villous on margines; leaf blades covered with pappili base hairs .....2. *D. sanguinalis*

Digitaria bicornis (Lam.) Roem. et Schult., Syr. Veg. ed. 15,2:470.1817.
Paspalum bicorne Lam., Encycl. 1:176.1791.
Distribution: Tripolitania and Fezzan.

Digitaria sanguinalis (L.) Scop., Fl. Carn. ed. 2, 1:52.1772.
Panicum sanguinalis L., Sp. Pl. ed. 1:57.1753.
Distribution: Tripolitania and N. Cyrenaica.

3. Echinochloa P. Beauv., Ess. Agrost. 53:161 & 169, Pl. 11, f. 2.1812.

3.1. *Echinochloa colona* (L.) Link, Hort. Berol. 2:209.1833.
Panicum colonum L., Syst. Nat. ed. 10, 2:870.1759.
Distribution: N. Cyrenaica.
This species is making a good fodder grassm; its grains are used in some parts of the world like rice.

4. *Eriochloa Kunth in H.B.K, Nov. Gen. et Spec. 1:94. Tab. 30 et 31.1816

4.1. **Eriochloa fatmensis* (Hoch & Steud.) W.D. Clayton in Kew Bull. 30:108.1975.
Panicum fatmense Hochst. Steud. in Sched., Schimp., It. Un. 806.1837; *P. annulatum* A. Rich., Tent. Fl. Abyss. 2:370. 1851; *Helopus nubicus* Steud., Syn. Pl. Glum. 1:100.1854; *Eriochloa acrotricha* (Steud.) Hack. ex Thell. in Viert. Nat-urf. Gas. Zurich 52:435.1907; *E. nubica* (Steud.) Hack. & Stapf ex Thell., l.c. 64:697.1919; *Digitaria acrotrichia* (Steud.) Roberty. Fl. Ouest-Afr. 397.1954.
Distribution: Tripolitania.

5. Panicum L., Sp. Pl. 55.1753; Gen. Pl. ed. 5: 29.18754.

1. Lower glume acute as long as the spikelet; plant shrub-like.....2. *P.turgidum*
1. Lower glume truncate much shorther than spikelet; plant not shrub-like.....1. *P. repens*

5.1. *Panicum repens* L., Sp. Pl. ed. 2:87.1762.
Distribution: Tripolitania.
This species is not very common in Libya.

5.2. *Panicum turgidum* Forssk., Fl. Aeg. Arab. 18.1775.
Distribution: Tripolitania.
This species is widely distributed in Libya except for Cyrenaica,and it is making a very good forage grass due to its soft and succulent young shoots.

6. Paspalum L., Syst. Nat. ed. 10:855.1759.

6.1. *Paspalum paspalodes* (Michx.) Scribner in Men. Torrey Bot. Club. 5:29.1894.
Digitaria paspalodes Michx., Fl. Bor. Amer. 1:46.1803; *P. distichum* L., ssp. paspalodes (Michx.) Thell., Fl. Adv. Montpellier 77.1912.
Distribution: Tripolitania.

7. Pennisetum L. C. Rich. In Pers., Syn. Pl. 1:72.1805.

1. Plants anuual; anthers bearded at apex.....1. *P. americanum**
1. Plants perennial; anthers not bearded at apex..... 2
2. Bristles scabrous all over.....2. *P. divisum*
2. Bristles not as above.....3
3. Leaf blades shorter than internodes.....3. *P. elatum*
3. Leaf blades longer than internodes.....4. *P. setaceum*

7.1.* *Pennisetum americanum* (L.) Schumann in Engl., Pflanzenw. Ost. Afr. B. 51. C. t. 4, f. A& B. 1895.
Panicum americanum L., Sp. Pl. 56.1753; *Alopecurus typhoides* Burm., Fl. Ind. 27. 1768; *Pennisetum typhiodes* (Burm.) tapf & C.E. Hubb., in Kew Bull. 1933:271.1933; *P. typhoideum* Rich. ap. Pers., Syn. 1, 72.1805.
Distribution: Ghadamas (S.W. of Tripoli).
This species is a drought resistant grass. Reported from cultivation in 1912 [8].

7.2. *Pennisetum divisum* (Forssk. ex Gmel.) Henrard in Blumea 3:162.1938.
Panicum divisum Forssk. ex Gmel., Syst. Nat. 2:156.1791; *P. dichotomum* Forssk., Fl. Aeg.- Arab. 20.1775; *Pennisetum dichotomum* (Forssk.) Delile, Fl. Egypt q159, t.8, f.1.1813.
Distribution: Tripolitania.
This species is one of the most palatable grasses for grazing animals.

7.3. *Pennisetum elatum* Hochst. ex Steudel, Syn. Pl. Glum. 1:106.1854.
Distribution: Tripolitania.

7.4. *Pennisetum setaceum* (Forssk.) Chiov. in Bull. Soc. Bot. Ital.113.1923.
Phalaris setacea Forssk., Fl. Aeg.- Arab. 17. 1775; *Pennisetum asperiflium* (Desf.) Kunth, R'ev. Gramin 1:49.1829.
Distribution: Tripolitania.
Although this species is not a good pasture, but it is still eaten by goats and gamels.

8. Seteria P. Beauv. Ess. Agrost. 51, t. 13, f. 3. 1812.

1. Lemma of upper floret transversely wrinkled.....2. *S. glauca*
1. Lemma of upper floret not as above.....2
2. Margins of leaf sheath hyaline, glabrous.....1. *S. adhaerens*
2. Margins of leaf sheath pilose.....3.*S. verticillata*

8.1. *Seteria adhaerens* (Forsk.) Chiov. In Nuov, Giorn. Bot. Ital. n.s. 26:77.1919.
Panicum adhaerens Forsk., Fl. Aeg. Arab. 20. 1775; *Seteria verticillata* (L.) P. Beauv ssp. aparine (Steud.) Durand & Barratte, Fl. Lib. Proder. 251.1910.
Distribution: Tripolitania, N. Cyrenaica and Ghadams.

8.2. *Seteria glauca* (L.) P. Beauv., Ess. Agrost. 51. 169, 178.1812.
Panicum glaucum L., Sp. Pl. 56.1753; *P. pumilum* Poir., Encyc. Suppl. 4:273.1816; *Seteria lutescens* (Weigel) F.T. Hubbard in Rhodora, 18:232.1916.
Distribution: N. Cyrenaica.

8.3. *Seteria verticillata* (L.) P. Beauv., Ess. Agrost. 51, 178.1812.
Panicum verticillatum L., Sp. Pl. ed. 2, 1:82.1762.
Distribution: N. Cyrenaica.

TRIBE 15: PHALARIDEAE

Annuals or perennials. Inflorescence panicle. Spikelets with one fertile florets and two sterile florets, some spikelets with only 2 florets one fertile and the other sterile; glumes well developed, large, winged on the keel. It is represented by 1 genus and 5 species.

1. Phalaris L., Sp. Pl. 54:1753; Gen. Pl. ed. 5:29.1754.

1. Spikelets in clusters of 5-7, only one bisexual the others male and sterile; wing with one prominent tooth near apex.....4. *P. paradoxia*
1. Spikelets solitary bisexual; wing entire or finely toothed near apex.....2
2. Spikelets with only one sterile floret.....3. *P. minor*

2. Spikelets with two sterile florets.....3
3. Sterile floret c. half (1/2) or more as long as the fertile floret.....2. *P. canariensis*
3. Sterile floret much less than 1/2 as long as the fertile floret.....4
4. Plants perennial; glumes obliquely truncate.....5. *P. truncate*
4. Plants annual; glumes acute or pointed.....1. *P. brachystachys*

1.1. *Phalaris brachystachys* Link in Schrad., Neues J. Bot. 1 (3): 134.1806.
P. canariensis L. ssp. *brachystachys* Pospichal, Fl. Oest. Kust., 1:59.1897.
Distribution: N. Cyrenaica.

Phalaris canariensis L., Sp. Pl. ed. 1:54.1753.
Distribution: N. Cyrenaica.
This species is a common canary grass, which is cultivated for the production of canary seeds.

Phalaris minor Retz. Obs. Bot. 3:8.1783.
Distribution: Tripolitania, N. Cyrenaica and Ghat.
This species represents a very good forage grass, because of that it is cultivated in Libya and elsewhere for such purpose.

1.4. *Phalaris paradoxa* L., Sp. Pl. ed. 2:1665.1753.
Distribution: N. Cyrenaica.
Two verities have been reported for this species. var. *parodoxa* with all spikelets uniform, and var. *praemorsa* (Lam.) Coss. et Dur., Expl. Sci. Alg., Glum: 25.1855., with some sterile spikelets reduced into club-shaped structures. In Libya *Phalaris paradoxa* is represented by var. *praemorsa*.

1.5. *Phalaris truncate* Guss., ex Bertol. Fl. Ital. 2:277.1836.
Distribution: N. Cyrenaica.

TRIBE 16: SPOROBOLEAE
Spikelets disarticulating above the glumes. Glumes usually unequal (at least one shorter than lemm). Lemma hyaline or membranous at maturity. Only 1genus and 1 species reported from Libya.

1. Sporobolus R. Br. Prodr. Fl. Nov. Holl. 169. 1810

1.1. *Sporobolus spicatus* (Vahl) Kunth. Rev. Gram. 1: 67. 1829.
Agrostis spicata Vahl, Symb. 1: 9. 1790.
Distribution: Fezzan, Ghat, Hun, and Jabal Uwainat.
This species grows well in sandy and saline soils.

TRIBE 17: STIPEAE
Inflorescence an open panicle. Spikelets 1 floret. Lemma awned at the tip. It is represented by 2 genera and 7 species.

1. Spikelets dorsally compressed with one floret; lemma membrneous, awned at the tip.....1. *Piptatherum*
1. Spikelets laterally compressed with one floret; lemma indurate, awned at the tip, awn simple.....2. *Stipa*

1. Piptatherum P. Beauv., Ess. Agrost. 17. 1812.

1. Inflorescence 1-3 branches at node; Spikelets 6mm-more long..... 1. *P.coerulescens*
1. Inflorescence 4-8 branches at node; Spikelets 4mm-less long.....2. *P. miliaceum*

1.1. *Piptatherum coerulescens* (Desf.) P. Beauv., Ess. Agrost. 18. 1812.
Milium coerulescens Desf. Fl. Atlant. 1: 66, t. 12. 1798; *Oryzopsis coerulescen* (Desf.) Hack. In Denksckr. Acad.

Wiss. Wien, 50, 2: 8. 1885.
Distribution: Tripolitania and N. Cyrenaica.

1.2. *Piptatherum miliaceum* (L.) Cosson, Nat. Pl. Crit, 129. 1851.
Agrostis miliaccea L. Sp. Pl. 61. 1753; *Oryzopsis miliacea* (L.) Benth. et Hooker f. ex Ascherson ex Schweinf.
Distribution: Tripolitania and N. Cyrenaica.
This species is a good forage grass.

2. Stipa L., Sp. PL. 78. 1753; Gen. Pl. ed. 5: 34. 1754

1. Annual; panicle dense; awn twisted into tail-like.....2. *S. capensis*
1. Perennial; panicle loose; awn not twisted into tail-like.....2
2. Awn hairy all over.....1. *S. barbat*
2. Awn scabrous – glabrous, if hairy, then on the lower half.....3
3. Upper glume 7-10 mm long; awn weakly kneed (curved).....4. *S. parviflora*
3. Upper glume longer; awn strongly kneed (curved).....4
4. Awn densely feathery on the lower half.....5. *S. tenacissima*
4. Awn not as above .....3. *S. legascae*

2.1. *Stipa barbata* Desf., Fl. Atlant. 1: 97.t. 27. 1798.
Distribution: Tripolitania and N. Cyrenaica
This species is not very common in Libya.

2.2. *Stipa capensis* Thumb. Prodr. Fl. Cap. 19. 1794.
S. retorta Cav. Osb. S. el R. de Valencia, 1: 119. 1795; 2:325.1797; *S. tortilis* Desf., Fl. Atlant. 1:99, t.31.1798.
Distribution: Tripolitania and N. Cyrenaica.
This species grows well in sandy and stony zones; it is very important as a forage grass.

2.3. *Stipa lagascae* Roem. et Schult., Syst. Veg. ed. 15, 2: 333.1817.
S. gigantean Lag.: Durand & Barratte, Fl. Lib. Prodr. 257.1910. Gen. et Sp. Pl. No. 27. 1816.
Distribution: Tripolitania, N. Cyrenaica, and Fezzan.

2.4. *Stipa parviflora* Desf., Fl. Atlant. 1: 98.t. 29. 1798.
Distribution: Tripolitania, N. Cyrenaica, and Fezzan.

2.5. *Stipa tenacissima* L., Cent. Pl. 1: 6. 1755.
Distribution: Tripolitania.
The species is the real sparto grass of which its leaves used in making mats and other articles. In the past the Libyan goverment used to export this species for its high quality paper making. Moreover, it is not good as a forage for livestock.

TRIBE 18: TRIPSACEAE
Tall plants, annuals. Inflorescence with spikelets bearing only unisexual florets, monecious; male spikeles with 2 florets; glumes equal; lemma and palea delicate-leafy; female spikelets with 2 florets one fertile and the other sterile; lower glume indurate. Small tribe represented by one genus and one species.

1. Zea L., Sp. Pl. 971.1753; Gen. Pl. ed. 5:419.1754.

1.1. *Zea mays* L., Sp. Pl. 971.1753.
Distribution: All over Libya.

In the genus *zea* the male flowers are at top of the plant, while the female flowers are at the bottom of the plant. *Zea mays* is cultivated for food for humain and as a forage grass for domestic animals. It is grown throughout Libya and widespread as a crop plant everywhere.

TRIBE 19: ZOYSIEAE

Annual or perennial. Inflorescence spike-like panicle. Spikelets in-group of 2-3 sessile with one hermaphrodite floret, awnless. Both glumes and at least the first glume covered with stout, hooked spines. Small tribe represented only by 1 genus and 1 species.

1. Tragus Haller, Hist. Stirp. Helv. 2:203.1768.

1.1. *Tragus racemose* (L.) All., Fl. Pedem. 2:24.1785.

Cenchrus racemosus L., Sp. Pl. ed. 1:1049.1753; *Lappago racemosa* (L.) Henck., Syn. Pl.Germ. 1:440.1792.

Distribution: Fezzan.

Excluded list of grass taxa

The following list includes 79 different grass taxa with 5 endemics [marked with an asterisk]. Such taxa have been descriped by some Eropean workers and deposited in herbara ouside Libya [Table 1]. Unfortunately, much of the Libyan collections are depsited in European herbaria [2].

Table 1 List of excluded grass taxa.

No.	Species excluded	No	Species excluded
1.	*Aegilops peregrina* (Hack.) Maire et Weiller	41.	*Lophochloa pubescens* (Lam.) Link
2.	*Aeluropus littoralis* (Gouan) Parl	42.	*Micropyrum tenellum* (L.) Link
3.	*Alopecurus urticulatus* Banks et Sol.	43.	*Oryza sativa* L.
4.	*Aira tenorii* Guss.	44.	*Panicum miliaceum* L.
5.	*Ammocloa palaestina* Boiss.	45.	*Parapholis marginata* Runemark
6.	*Ammochloa pungens* (Schreb.) Boiss.	46.	*Parapholis strigosa* (Dumort.) C. E. Hubbard
7.	*Ampelodesmos mauritanicus* (Poiret) Th. Dur. et Schinz	47.	*Paspalidium geminatum* (Forsk.) Stapf
8.	*Antinoria insularis* Parl	48.	*Phalaris aquatic* L.
9.	*Aristida funiculata* Trin. et Rupr.	49.	*Phalaris coerulescens* Desf.
10.	*Aristida meccana* Hochst.	50.	*Phleum subulatum* (Savi) Asch. et Graebn.
11.	*Aristida mutabilis* Trin et Rupr.	51.	*Piptatherum holciforme* (Bieb.) Roem.et Schult.
12.	*Asthenatherum fragile* (Guinet et Souvage) Monod	52.	*Polypogon maritimus* Willd.
13.	*Avena eriantha* Dur.	53.	*Saccharum officinarum* L.
14.	*Avena ventricosa* Balansa ex Coss.	54.	*Secale cereale* L.
15.	*Avenula bromoides* (Gouan) H. Scholz	55.	*Secale montanum* Guss.
16.	*Brachypodium retusum* (Pers.) P. Beauv.	56.	*Setaria italica* (L.) P. Beauv.
17.	*Briza minor* L.	57.	Seteria verticillata x S. viridis
18.	*Bromus chrysopogon* Viv.	58.	*Setaria viridis* (L.) P. Beauv
19.	*Bromus scoparius* L.	59.	*Sorghum bicolor* (L.) Moench
20.	*Castellia tuberculosa* (Moris) Bor.	60.	*Sorghum sudanense* (Piper) Stapf
21.	*Catabrosa aquatica* (L.) P. Beauv.	61.	*Sporobolus helvolus* (Trin.) Th., Durand & Schinz
22.	*Catapodium hemipoa* (Delile ex Spreng.) Lainz	62.	*Sporobolus virginicus* (L.) Kunth
23.	*Crypsis schoenoides* (L.) Lam.	63.	*Stipa nitens* Ball.

24.	*Ctenopsis pectinella* (Del.) De Not.	64.	**Stipagrostis libyca* (H. Scholz) H. Scholz
25.	*Cutandia dichotoma* (Forssk.) Trabut	65.	*Stipagrostis multinerva* H. Scholz
26.	**Cynosurus junceus* Murb.	66.	*Stipagrostis rigidfola* H. Scholz
27.	*Desmazeria sicula* (Jacq.) Dumort	67.	**Stipagrostis shawii* (H. Scholz) H. Scholz
28.	*Echinaria colona* (L.) Link.	68.	*Stipagrostis vulnerans* (Trin. Et Rupr.) de Winter
29.	*Eleusine compressa* (Forsk.) Aschers. & Schw. ex Chr.	69.	*Stipgrostis zittelii* (Aschers.) de Winter
30.	*Elytrigia littoralis* (Host) Hyl.	70.	*Tetrapogon villosus* Desf.
31.	*Elytrigia repens* (L.) Desv. ex Nevski	71.	*Triplachne nitens* (Guss.) Link
32.	*Enneapogon desvauxii* P. Beauv	72.	*Trisetaria glumacea* (Boiss.) Maire
33.	*Eragrostis ciliaris* (L.) R.Br.	73.	*Trisetaria linearis* Forsk.
34.	*Eragrosts tef* (Zucc.) Trotter	74.	**Trisetaria vaccariana* (Maire et Winter) Maire
35.	*Gastridium scabrum* C. Presl.	75.	*Triticum durum* Desf.
36.	*Hainardia cylindrica* (Willd.) Greuter	76.	*Triticum polonicum* L.
37.	*Hordeum distichon* L.	77.	*Triticum spelta* L.
38.	*Hordeum geniculatum* All.	78.	*Vulpia ligustica* (All.) Lin.
39.	*Leersia hexandra* Swartz	79.	*Vulpia myurosa* (L.) C.C. Gmel.
40.	**Libyella cyrenaica* (Durand & Barratte) Pamp.		

3. RESULTS

Tribes, genera, species, new records, citations, synonyms and distribution of grass species in Libya were studied. The results of this study revealed the presence of only 152 species belong to 73 genera in Libya, however, the size of the grass family published in the flora of Libya No. 145.was 93 genera, and 228 species, such number includes all grasses, which were reported by some European workers and deposited in hrbaria outside Libya. In this study the grass species, which are not represented by voucher specimens and deposited in herbarium [ULT], have been excluded. Moreover, the results showed that the tribes Festuceae, Hordeae, Aveneae, Paniceae, and Andropogoneae are considered as the most sizable tribes with 41, 20, 17, 16, 10 species respectively. Other tribes, such as Eragrostideae, Aristideae, Agrostideae, Stipeae, and Phalarideae represented by 9, 8, 7, 7, 5 species respectively. Whereas, the rest of tribes are represented by 1-3 species [Table 2]. Moreover, the results of this study indicates that the genera *Bromus*, *Poa*, and *Stipagrosts* are the largest genera among the grass family of Libya with 11, 8, 7 species respectively. Other genera such as *Aegilops*, *Avena*, *Hordeum*, *Phalaris*, *Stipa*, and *Vulpia* with 5 species each, while the genera *Eragrostis*, *Lolium*, *Lophochloa*, and *Pennisetum* with 4 species each [Table 3]. Other genera represented by 1-3 species each, such results indicates that the size of genera is too small compared to the size of the family. 40 genera with only one species including a monotypic onse represent 26.31% of the grass taxa included in this study [Table 4], such percentage revealed that the number of species per genera is very low. Three new records were reported for the first time in Libya. Based on the present results the most characterstic features of the grass family is the large number of genera 73 in proportion to the number of species 152, such character declears that most of the grass genera represented by 1-3 species each. In fact, this characterstic feature is very common in the flora of Libya. In addation to that, the grass family represents only 7.49% of the flopra of Libya with respect to 779 genera and 2028 species of Angiosperms [14] [Table 5]; such observation indicates that the size of grass family is small compared to the flora of Libyan, which itself not a very rich and still poor with regard to the vast area of Libya.

Table 2 Number of genera, species, and percentage of species in each tribe per the size of the grass family.

Tribes	Number of genera	Number of species	persentage
Aeluropodeae	1	1	0.65%
Agrostideae	6	7	4.60%
Andropogoneae	8	10	6.57%
Aristideae	2	8	5.26%
Arundineae	2	2	1.31%

Aveneae	8	17	11.18%
Chlorideae	2	3	1.97%
Eragrostideae	5	9	5.92%
Festuceae	15	41	26.97%
Hordeae	7	20	13.15%
Lygeae	1	1	0.65%
Meliceae	1	1	0.65%
Milieae	1	1	0.65%
Paniceae	8	16	10.52%
Phalarideae	1	5	3.28%
Sporoboleae	1	1	0.65%
Stipeae	2	7	3.07%
Tripsaceae	1	1	0.65%
Zoysieae	1	1	0.65%

Table 3 The most sizable genera present in Libya and percentage of species per the size of the grass family.

Genera	Number of species	percentage
Bromus	11	7.23%
Poa	8	5.26%
Stipagrosts	7	4,60%
Aegilops	5	3.28%
Avena	5	3.28%
Hordeum	5	3.28%
Phalaris	5	3.28%
Stipa	5	3.28%
Vulpia	5	3.28%
Eragrostis	4	2.63%
Lolium	4	2.63%
Lophochloa	4	2.63%
Pennisetum	4	2.63%

Table 4 List of grass genera with only one species including monotypic genera [marked with an asterisk].

Number	Genera	Number	Genera	Number	Genera
1.	Aeluropus Trin.	16.	*Dinebra Jacq.	31.	Paspalum L.
2.	Ammophila Host	17.	Echinochloa P. Beauv.	32.	Phragmites Adans.
3.	Andropogon L.	18.	Elytrigia Desv.	33.	*Psilurus Trin.
4.	Aristida L.	19.	Festuca L.	34.	Sorghum Moench
5.	Arundo L.	20.	Gastridium P. Beauv.	35.	Sporobolus R. Br.
6.	Astenatherum Nevski	21.	Gaudinia P. Beauv.	36.	*Trachynia Link
7.	*Avellina Parl.	22.	Hyparrhenia Anderss. ex Fourn.	37.	Tragus Hallere
8.	Briza L.	23.	Imperata Cyr.	38.	Trisetaria Forssk.
9.	Corynephorus P. Beauv.	24.	*Lagurus L.	39.	*Vulpiella (Trabut) Andr.
10.	*Crithopsis Jaub et Spach	25.	*Lamarckia Moench.	40.	Zea L.
11.	Cympopogon	26.	Lasiurus Boiss		

	Spreng.				
12.	Cynodon Rich.	27.	*Lygeum Loefl. ex Linn.		
13.	Dactylis L.	28.	Melica L.		
14.	Dactyloctenium Willd.	29.	Milium L.		
15.	*Desmostachya Stapf	30.	Parapholis C.E. Hubbard		

Table 5 Percentage of genera and species of the grass family in relation to the flora of Libya.

Taxon	Libya flora	Grass family	percentage
Genera	779	73	9.37%
Species	2028	152	7.49%

4. DISCUSSION & CONCLUSION

The present study revealed that the grass family is small with 19 tribes, 73 genera, and 152 species. The family with such number of species is considered very small with regard to the large area of Libya. Keys for tribes, genera, and species were constructed. Three new reported species were included in this study. Endimasim is very low in Libya, since only 4% of Libyan taxa are endemic [7]. Only 7 endemics were reported for the entire grass family, these are *Cynosurus junceus*, *Libyella Cyrenaica*, *Poa pentapolitana*, *Poa vaginata*, *Stipagrosts libyca*, *Stipcrosts shawii*, and *Trisetaria vaccariana*. In this study, only two endemic species were included *Poa pentapolitana*, and *Poa vaginata*, while the other 5 endemics were reported and deposited in European herbaria and no voucher specimens have been collected and seen recently in Libya. Therefore, those endemics are added in the excluded list of taxa.

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